MC9090-G RFID Mobile Computer

RFID Integrator Guide Supplement

symbol®
The Enterprise Mobility Company™

MC9090-G RFID Integrator Guide Supplement

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symbol®
The Enterprise Mobility Company™

Symbol Technologies, Inc.
One Symbol Plaza
Holtsville, New York 11742-1300
http://www.symbol.com

Patents

This product is covered by one or more patents listed on the website: http://www.symbol.com/patents.

Revision History

Changes to the original manual are listed below:

Change	Date	Description
-01 Rev. A	12/06	Initial Release

Table of Contents

Chapter i

About This Guide

Introduction

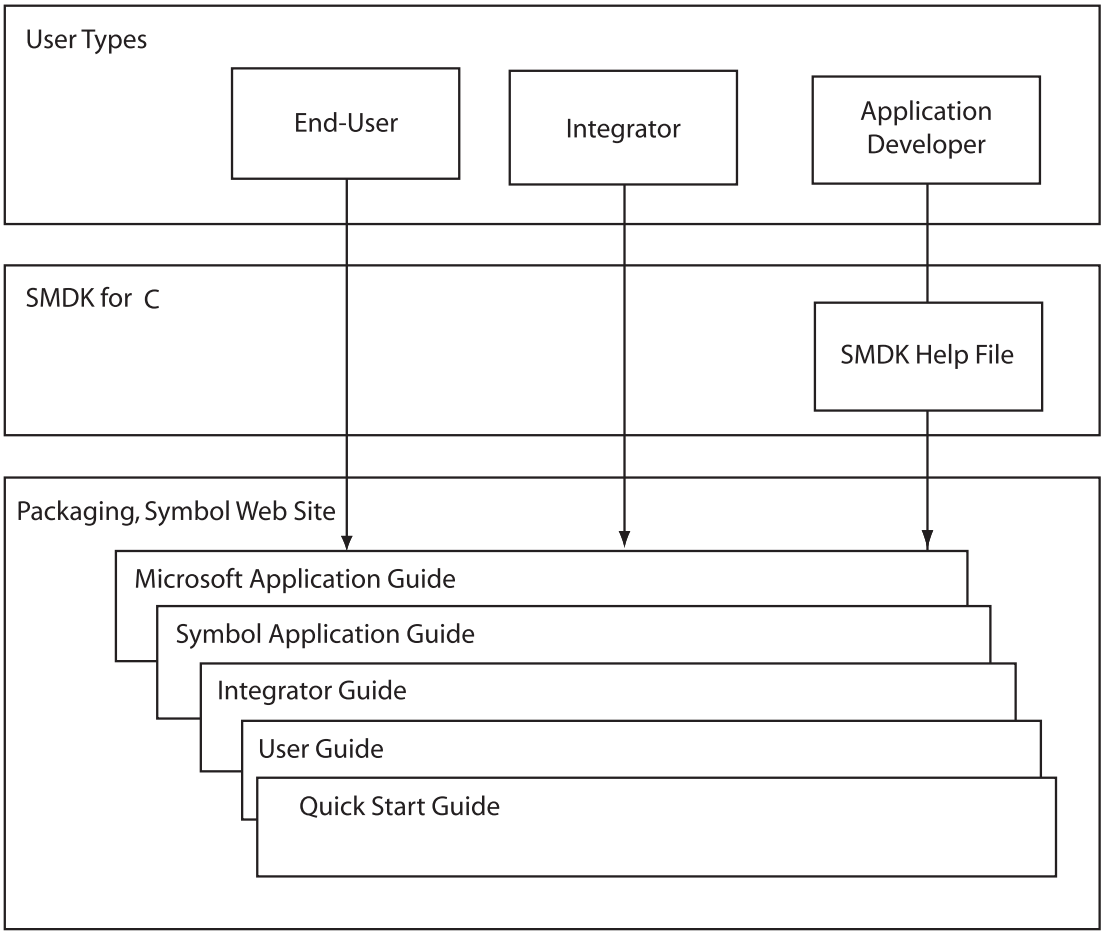
This MC9090-G RFID Integrator Guide Supplement provides the unique set up and configuration procedures for the MC9090-G RFID mobile computers and accessories. This guide is intended as a supplement to the *MC909X Integrator Guide, P/N: 72E-72216-xx.* Procedures common to the MC909X series of products are referenced to the *MC909X Integrator Guide.*

NOTE Screens and windows pictured in this guide are samples and may differ from actual screens.

Documentation Set

The documentation set for the MC9090-G RFID is divided into guides that provide information for specific user needs.

- **Microsoft Application Guide** - describes how to use Microsoft developed applications.
- **Symbol Application Guide** - describes how to use Symbol developed applications.
- **MC909X User Guide** - describes how to use the MC909X mobile computers.
- **MC9090-G RFID User Guide Supplement**- describes how to use the MC9090-G RFID mobile computer.
- **MC909X Integrator Guide** - describes how to set up the MC909X mobile computers and the accessories.
- **MC9090-G RFID Integrator Guide Supplement** - describes how to set up the MC9090-G RFID mobile computer and the accessories.
- **SMDK Help File** - provides API information for writing applications.



Configurations

This guide covers the following configurations:

Configuration	Radios	Display	Memory	Data Capture	Operating System	Keypads
MC9090-G RFID	WLAN 802.11b/g and Bluetooth	Color	64 MB RAM/ 128 MB Flash	Imager	Windows Mobile 5.0 Professional	53-key RFID

Chapter Descriptions

Topics covered in this guide are as follows:

- Chapter 1, Getting Started, provides information on charging the mobile computer battery and resetting.
- Chapter 2, Accessories, describes the accessories available for the mobile computer and how to set up power connections and battery charging capabilities, where applicable.
- Chapter 3, Application Deployment for Mobile 5.0, provides application deployment instructions.
- Chapter 4, RFID Demo, provides an introduction to the RFID Demo application and a description of the features.
- Chapter 5, Maintenance & Troubleshooting, includes instructions on cleaning and storing the mobile computer, and provides troubleshooting solutions for potential problems during mobile computer operation.
- Appendix A, Technical Specifications, includes a table listing the technical specifications for the mobile computer.

Notational Conventions

The following conventions are used in this document:

- “Mobile computer” refers to the Symbol MC909X series of hand-held computers.
- *Italics* are used to highlight the following:
  - Chapters and sections in this guide
  - Related documents
- **Bold** text is used to highlight the following:
  - Dialog box, window and screen names
  - Drop-down list and list box names
  - Check box and radio button names
  - Icons on a screen
  - Key names on a keypad
  - Button names on a screen
- Bullets (•) indicate:
  - Action items
  - Lists of alternatives
  - Lists of required steps that are not necessarily sequential
- Sequential lists (e.g., those that describe step-by-step procedures) appear as numbered lists

Related Documents and Software

The following documents provide more information about the MC909X mobile computers.

- *MC9090-G RFID Quick Start Guide,* p/n 72-89960-xx
- *MC9090-G RFID Windows® Mobile® 5.0 Regulatory Guide*, p/n 72-89961-xx
- *MC909X User Guide*, p/n 72E-72215-xx
- *MC909X Integrator Guide*, p/n 72E-72216-xx
- *Symbol Application Guide for Symbol Devices*, p/n 72E-68901-xx
- *Microsoft Applications for Mobile and WinCE 5.0 User Guide*, p/n 72E-78456-xx
- *Symbol Mobility Developer Kit (SMDK) Help File*, p/n 72E-38880-03
- *Symbol Mobility Developer Kits,* available at: http://devzone.symbol.com.
- Device Configuration Package (DCP for MC9090c50) and Platform SDK (PSDK9090c50) for MC9090-G, available at: http://devzone.symbol.com.
- ActiveSync software, available at: http://www.microsoft.com.

For the latest version of this guide and all guides, go to: http://www.symbol.com/manuals.

Service Information

If an equipment problem occurs, contact the appropriate regional Symbol Support Center for contact information. Before calling, have the model number, serial number and several bar code symbols at hand.

Call the Support Center from a phone near the scanning equipment so that the service person can try to talk through the problem. If the equipment is found to be working properly and the problem is symbol readability, the Support Center will request samples of bar codes for analysis at our plant.

If the problem cannot be solved over the phone, the equipment may need to be returned for servicing. If that is necessary, specific directions will be provided.

✓ ***NOTE*** Symbol Technologies is not responsible for any damages incurred during shipment if the approved shipping container is not used. Shipping the units improperly can possibly void the warranty.

Symbol Support Center

For service information, warranty information or technical assistance contact or call the local Symbol Support Center:

Country/Region	Address	Telephone
United States	Symbol Technologies, Inc. One Symbol Plaza Holtsville, New York 11742-1300	1-800-653-5350
Canada	Symbol Technologies Canada, Inc. 5180 Orbitor Drive Mississauga, Ontario, Canada L4W 5L9	1-866-416-8545 (Inside Canada) 905-629-7226 (Outside Canada)
United Kingdom	Symbol Technologies Symbol Place Winnersh Triangle, Berkshire RG41 5TP United Kingdom	0800 328 2424 (Inside UK) +44 118 945 7529 (Outside UK)
Asia/Pacific	Symbol Technologies Asia, Inc. (Singapore Branch) 230 Victoria Street #12-06/10 Bugis Junction Office Tower Singapore 188024	Tel: +65-6796-9600 Fax: +65-6337-6488
Australia	Symbol Technologies Pty. Ltd. 432 St. Kilda Road Melbourne, Victoria 3004	1-800-672-906 (Inside Australia) +61-3-9866-6044 (Outside Australia
Österreich/Austria	Symbol Technologies Austria GmbH Prinz-Eugen Strasse 70 / 2.Haus 1040 Vienna, Austria 01-5055794-0 (Inside Austria)	+43-1-5055794-0 (Outside Austria)
Danmark/Denmark	Symbol Technologies AS Dr. Neergaardsvej 3 2970 Hørsholm	7020-1718 (Inside Denmark) +45-7020-1718 (Outside Denmark)
Europe/Mid-East Distributor Operations		Contact the local distributor or call +44 118 945 7360
Suomi/Finland	Oy Symbol Technologies Kaupintie 8 A 6 FIN-00440 Helsinki, Finland	9 5407 580 (Inside Finland) +358 9 5407 580 (Outside Finland)
France	Symbol Technologies France Centre d'Affaire d'Antony 3 Rue de la Renaissance 92184 Antony Cedex, France	01-40-96-52-21 (Inside France) +33-1-40-96-52-50 (Outside France)

Country/Region	Address	Telephone
Deutschland/ Germany	Symbol Technologies GmbH Waldstrasse 66 D-63128 Dietzenbach, Germany	6074-49020 (Inside Germany) +49-6074-49020 (Outside Germany)
Italia/Italy	Symbol Technologies Italia S.R.L. Via Cristoforo Columbo, 49 20090 Trezzano S/N Navigilo Milano, Italy	2-484441 (Inside Italy) +39-02-484441 (Outside Italy)
Latin America Sales Support	2730 University Dr. Coral Springs, FL 33065 USA	1-800-347-0178 (Inside United States) +1-954-255-2610 (Outside United States) 954-340-9454 (Fax)
México/Mexico	Symbol Technologies Mexico Ltd. Torre Picasso Boulevard Manuel Avila Camacho No 88 Lomas de Chapultepec CP 11000 Mexico City, DF, Mexico	5-520-1835 (Inside Mexico) +52-5-520-1835 (Outside Mexico)
Nederland/ Netherlands	Symbol Technologies Kerkplein 2, 7051 CX Postbus 24 7050 AA Varsseveld, Netherlands	315-271700 (Inside Netherlands) +31-315-271700 (Outside Netherlands)
Norge/Norway	Symbol's registered and mailing address: Symbol Technologies Norway Hoybratenveien 35 C N-1055 OSLO, Norway Symbol's repair depot and shipping address: Symbol Technologies Norway Enebakkveien 123 N-0680 OSLO, Norway	+47 2232 4375

Country/Region	Address	Telephone
South Africa	Symbol Technologies Africa Inc. Block B2 Rutherford Estate 1 Scott Street Waverly 2090 Johannesburg Republic of South Africa	11-809 5311 (Inside South Africa) +27-11-809 5311 (Outside South Africa)
España/Spain	Symbol Technologies S.L. Avenida de Bruselas, 22 Edificio Sauce Alcobendas, Madrid 28108 Spain	91 324 40 00 (Inside Spain) +34 91 324 40 00 (Outside Spain) Fax: +34.91.324.4010
Sverige/Sweden	“Letter” address: Symbol Technologies AB Box 1354 S-171 26 SOLNA Sweden Visit/shipping address: Symbol Technologies AB Solna Strandväg 78 S-171 54 SOLNA Sweden	Switchboard: 08 445 29 00 (domestic) Call Center: +46 8 445 29 29 (international) Support E-Mail: Sweden.Support@se.symbol.com

If the Symbol product was purchased from a Symbol Business Partner, contact that Business Partner for service.

Chapter 1 Getting Started

Introduction

This chapter lists the accessories for the MC9090-G RFID mobile computer and explains how to install and charge the batteries, replace the strap and start the mobile computer for the first time.

NOTE This MC9090-G RFID Integrator Guide Supplement is intended as a supplement to the MC909X Integrator Guide, P/N: 72E-72216-xx. Procedures common to the MC909X series of products are referenced to the MC909X Integrator Guide.

MC909X Integrator Guide

The MC909X Integrator Guide, P/N: 72E-72216-xx provides the following support information applicable to the MC9090-G RFID mobile computer:

- **Accessories**; describes the accessories available for the mobile computers and how to set up power connections and battery charging capabilities, where applicable.
- **ActiveSync**; provides instructions on installing ActiveSync and setting up a partnership between the mobile computer and a host computer.
- **Wireless Applications**; provides instructions using and configuring the mobile computer on a wireless network.
- **Wireless Applications**; describes how to configure the WLAN wireless connection.
- **Rapid Deployment Client**; explains how to use the Rapid Deployment Client to facilitate software downloads to the mobile computer from a Mobility Services Platform (MSP) Console FTP server.
- **AirBEAM Client**; explains how to set up the mobile computer to synchronize with a server using the AirBEAM® Client and AirBEAM Staging applications.
- **Application Deployment for WinCE 5.0**; provides instructions for installing the Device Configuration Package (DCP) for MC909X and the SMDK for C on the host computer.and downloading software and files to the mobile computer.
- **Maintenance & Troubleshooting**; includes instructions on cleaning and storing the mobile computer, and provides troubleshooting solutions for potential problems during mobile computer operation.

Unpacking the Mobile Computer

Carefully remove all protective material from around the mobile computer and save the shipping container for later storage and shipping.

Verify that you received all equipment listed below:

- Mobile computer
- Lithium-ion battery
- Strap, attached to the mobile computer
- Stylus, in the stylus silo
- Regulatory Guide
- Quick Start Guide (poster)

Inspect the equipment for damage. If you are missing any equipment or if you find any damaged equipment, contact the Symbol Technologies Support Center immediately. See *page xii* for contact information.

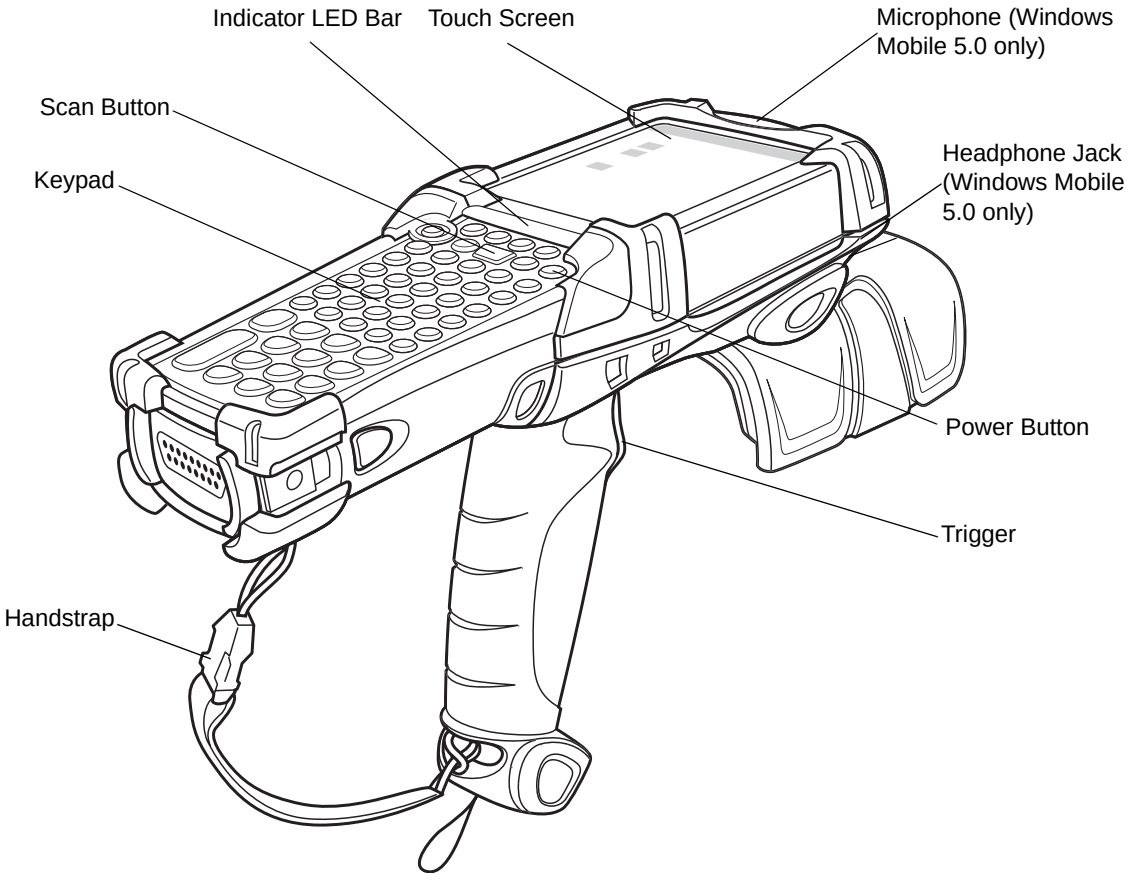


Figure 1-1 *MC9090-G RFID Mobile Computer*

Accessories

Table 1-1 lists the accessories available for the MC9090-G RFID.

Table 1-1 *MC9090-G RFID Accessories*

Accessory	Description
Cable Adapter Module (CAM)	Snap-on required to connect the following cables to the mobile computer. • AC line cord (country-specific) and power supply, charges the mobile computer. • Auto charge cable, charges the mobile computer using a vehicle's cigarette lighter. • DEX cable, connects the mobile computer to a vending machine. • Serial cable, adds serial communication capabilities. • USB cable, adds USB communication capabilities. • Printer cable, adds printer communication capabilities.
Four Slot Charge Only Cradle	Charges the mobile computer main battery.
Four Slot Ethernet Cradle	Charges the mobile computer main battery and synchronizes the mobile computer with a host computer through an Ethernet connection.
Four Slot Spare Battery Charger	Charges up to four mobile computer spare batteries.
Magnetic Stripe Reader (MSR)	Snaps on to the mobile computer and adds magstripe read capabilities.
Modem Module	Enables data communication between the mobile computer and a host computer, remotely through the phone lines, and synchronizes information between the mobile computer and a host computer.
Multimedia Card (MMC)	Provides secondary non-volatile storage.
Single Slot Serial/USB Cradle	Charges the mobile computer main battery and a spare battery. It also synchronizes the mobile computer with a host computer through either a serial or a USB connection.
Software	*Symbol Mobility Developer Kits* available at: http://devzone.symbol.com.
	Device Configuration Package (DCPforMC9090c50) and Platform SDK (PSDK9090c50) for MC9090-G, available at: http://devzone.symbol.com.
Spare lithium-ion battery	Replacement battery.
Stylus	Performs pen functions.
Universal Battery Charger Adapter	Adapts the UBC for use with the Series 9000 batteries.
Wall Mounting Bracket and Shelf Slide	Use for wall mounting applications.

Getting Started

In order to start using the mobile computer for the first time:

- Install the main battery
- Charge the main battery and backup battery
- Start the mobile computer
- Configure the mobile computer

The main battery can be charged before or after it is installed. Use one of the spare battery chargers to charge the main battery (out of the mobile computer), or one of the cradles to charge the main battery installed in the mobile computer.

Installing and Removing the Main Battery

Installing the Main Battery

Before using the mobile computer, install a lithium-ion battery by sliding the battery into the mobile computer as shown in *Figure 1-2*.

NOTE Ensure the battery is fully inserted. Two audible clicks can be heard as the battery is fully inserted. A partially inserted battery may result in unintentional data loss.

When a battery is fully inserted in a mobile computer for the first time, upon the mobile computer's first power up, the device boots and powers on automatically.

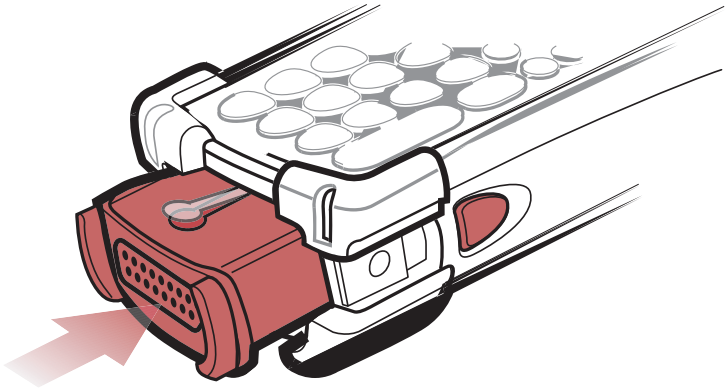


Figure 1-2 *Installing the Main Battery*

Charging the Battery

Charging the Main Battery and Memory Backup Battery

Before using the mobile computer for the first time, charge the main battery until the amber charge indicator light remains lit (see *Table 1-2 on page 1-4* for charge status indications). Charge time is less than four hours. The mobile computer can be charged using a cradle, the CAM with a charging cable, or the MSR with the appropriate power supply.

The mobile computer is equipped with a memory backup battery which automatically charges from the fully-charged main battery. When the mobile computer is used for the first time, the backup battery requires

approximately 15 hours to fully charge. This is also true any time the backup battery is discharged, which occurs when the main battery is removed for several hours. The backup battery retains data in memory for at least 30 minutes when the mobile computer's main battery is removed. When the mobile computer reaches a very low battery state, the combination of main battery and backup battery retains data in memory for at least 72 hours.

NOTE Do not remove the main battery within the first 15 hours of use. If the main battery is removed before the backup battery is fully charged, data may be lost.

Use the following to charge batteries:

- Cradles: The mobile computer slips into the cradles for charging the battery in the mobile computer (and spare batteries, where applicable).
  - Single Slot Serial/USB Cradle.
  - Four Slot Ethernet Cradle and Four Slot Charge Only Cradles.
- Accessories: The mobile computer’s snap-on accessories provide charging capability, when used with one of the accessory charging cables.
  - CAM
  - MSR.
- Chargers: The mobile computer’s spare battery charging accessories are used to charge batteries that are removed from the mobile computer.
  - Single Slot Serial/USB Cradle
  - Four Slot Spare Battery Charger
  - Universal Battery Charger (UBC).

✓ ***NOTE*** To achieve the best battery life in mobile computers with multiple radios, turn off the radios that are not being used. This can be accomplished via the SetDevicePower() API (refer to the SMDK Help File for Symbol Mobile Computers) or via the Control Panel application (tap **Start** > **9000 Demo** > **Ctl Panel** icon).

Charging the Main Battery

Charge the main battery in the mobile computer using a cradle, the CAM with a charging cable, or the MSR with the appropriate power supply.

1. Ensure the accessory used to charge the main battery is connected to the appropriate power source (see Chapter 2, Accessories for setup information).
2. Insert the mobile computer into a cradle or attach the appropriate snap-on module.
3. The mobile computer starts to charge automatically. The amber charge LED, in the Indicator LED Bar, lights to show the charge status. See *Table 1-2* for charging indications.

The main battery usually fully charges in less than four hours.

Table 1-2 *Mobile Computer LED Charge Indicators*

LED	Indication
Off	Mobile computer not in cradle or the mobile computer is not attached to the CAM or MSR. Mobile computer not placed correctly. Charger is not powered.
Fast Blinking Amber	Error in charging; check placement of the mobile computer.
Slow Blinking Amber	Mobile computer is charging.
Solid Amber	Charging complete.

Charging Spare Batteries

Use the following three accessories to charge spare batteries:

- Single Slot Serial/USB Cradle
- Four Slot Spare Battery Charger
- UBC Adapter.

To charge a spare battery:

1. Ensure the accessory used to charge the spare battery is connected to the appropriate power source (see Chapter 2, Accessories for setup information).
2. Insert the spare battery into the accessory's spare battery charging slot with the charging contacts facing down (over the charging pins) and gently press down on the battery to ensure proper contact.
3. The battery starts to charge automatically. The amber charge LED on the accessory lights to show the charge status. See Chapter 2, Accessories for charging indications for the accessory.

The battery usually fully charges in less than four hours.

Removing the Main Battery

To remove the main battery:

1. Prior to removing the battery, press the red **Power** button to place the mobile computer in the suspend mode.
2. Simultaneously press both primary battery releases. The battery partially ejects from the mobile computer.
3. Pause 3-4 seconds while the mobile computer performs battery removal shutdown.
4. Press the secondary battery release, on top of the battery, and slide the battery out of the mobile computer.

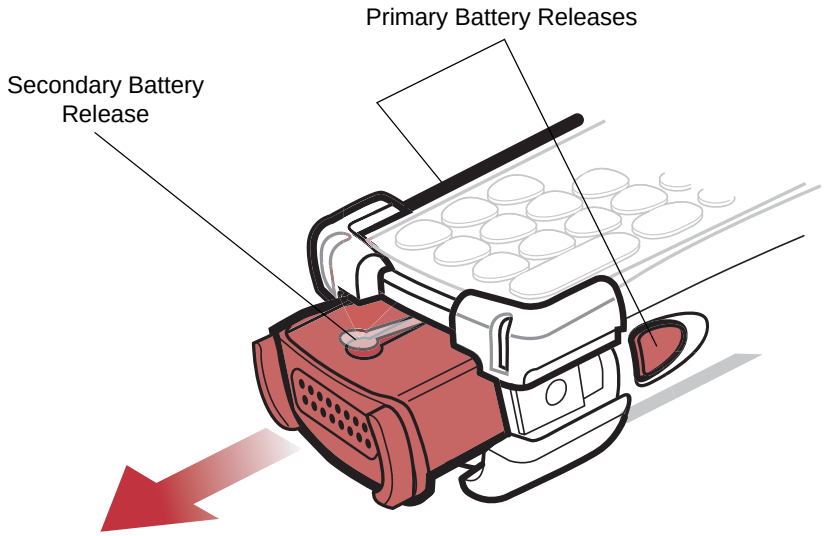


Figure 1-3 *Removing the Main Battery*

Starting the Mobile Computer

Press the red **Power** button to turn on the mobile computer. If the mobile computer does not power on, perform a cold boot. See *Performing a Cold Boot on page 1-10*.

NOTE When a battery is fully inserted in a mobile computer for the first time, upon the first power up, the device boots and powers on automatically.

When the mobile computer is powered on for the first time, it initializes its system. The *Symbol* splash screen (*Figure 1-4*) appears for a short period of time.

Figure 1-4 *Symbol Splash Window*

Calibrating the Screen

To calibrate the screen so the cursor on the touch screen aligns with the tip of the stylus:

1. Using the stylus carefully press and briefly hold the tip of stylus on the center of each target that appears on the screen.

> ***NOTE*** To re-calibrate the screen at anytime, press the blue **FUNC** and **ESC** keys on the mobile computer to launch the calibration screen application.

2. Repeat as the target moves around the screen or press **ESC** to cancel.

Checking Battery Status

To check whether the main battery or backup battery in the mobile computer is charged, tap *Start* - *Settings* - *System Tab* - *Power* icon to display the *Battery Status* window.

To save battery power, set the mobile computer to turn off after a specified number of minutes.

Configuring the Mobile Computer

- To customize the mobile computer settings, refer to the *Microsoft Applications for Symbol Devices User Guide*.
- To set up ActiveSync to synchronize the mobile computer with the host computer, see the MC909X Integrator Guide, P/N: 72E-72216-xx.
- To configure the mobile computer for WLAN network, see the MC909X Integrator Guide, P/N: 72E-72216-xx..
- To configure the mobile computer using the Rapid Deployment Client, see the MC909X Integrator Guide, P/N: 72E-72216-xx.
- To set up AirBEAM to synchronize the mobile computer with the host server, see the MC909X Integrator Guide, P/N: 72E-72216-xx.
- To install development software on the development PC, see Chapter 3, Application Deployment for Mobile 5.0 and see the MC909X Integrator Guide, P/N: 72E-72216-xx..

Resetting the Mobile Computer

If the mobile computer stops responding to input, reset it. There are two reset functions, warm boot and cold boot. A warm boot restarts the mobile computer by closing all running programs.

A cold boot also restarts the mobile computer, but erases all stored records and entries in RAM. Data saved in flash memory or a memory card is not lost. In addition it returns formats, preferences and other settings to the factory default settings.

Perform a warm boot first. This restarts the mobile computer and saves all *stored* records and entries. If the mobile computer still does not respond, perform a cold boot.

Performing a Warm Boot

Hold down the **Power** button for approximately five seconds. As soon as the mobile computer starts to perform a warm boot release the **Power** button.

Performing a Cold Boot

A cold boot restarts the mobile computer and erases all user stored records and entries that are not saved in flash memory (Application and Platform folders) or a memory card. *Never perform a cold boot unless a warm boot does not solve the problem.*

CAUTION Do not hold down any key, button or the trigger, other than the **Power** button during a reset. Performing a cold boot restores formats, preferences and other settings to the default settings.

NOTE Any data previously synchronized with a computer can be restored during the next ActiveSync operation.

To perform a cold boot:

1. Press the primary battery release on the mobile computer to partially eject the battery from the mobile computer.
2. On an MC9090-G, while the battery is partially released, simultaneously press and release the trigger and the **Power** button.
3. Push the battery to fully re-insert it in the mobile computer. One audible click can be heard as the battery is fully inserted.
4. The mobile computer initializes.

Battery Management

Battery Saving Tips

- Leave the mobile computer connected to AC power at all times when not in use.
- Set the mobile computer to turn off after a short period of non-use.
- Set the display and keyboard backlight to turn off after a short period of non-use.
- Turn off all wireless radio activity when not in use.
- Power off the mobile computer when charging to charge at a faster rate.

Changing the Power Settings

To set the mobile computer to turn off after a short period of non-use:

1. On devices with Windows Mobile 5.0, tap **Start** > **Settings** > **System** tab > **Power** icon > **Advanced** tab.
2. Select the **On battery power: Turn off device if not used for:** check box and select a value from the drop-down list box.
3. Tap **OK**.

Changing the Display Backlight Settings

To change the display backlight settings in order to conserve more battery power:

1. On devices with Windows Mobile 5.0, tap **Start** > **Settings** > **System** tab > **Backlight** icon > **Battery Power** tab.
2. Select the **On battery power: Disable backlight if not used for:** check box and select a value from the drop-down list box.
3. Tap the **Brightness** tab.
4. Tap the **Disable backlight** check box to completely turn off the display backlight.
5. Use the slider to set the brightness of the backlight. Set it to a low value to save battery power.
6. Tap **OK**.

Changing the Keypad Backlight Settings

To change the keypad backlight settings in order to conserve more battery power:

1. On devices with Windows Mobile 5.0, tap **Start** > **Settings** > **System** tab > **Keylight** icon > **Battery Power** tab.
2. Select the **On battery power: Disable keylight if not used for:** check box and select a value from the drop-down list box.
3. Tap the **Advanced** tab.
4. Tap the **Disable keylight** check box to completely turn off the display backlight.
5. Tap **OK**.

Turning the Radios Off

WLAN Radio on Windows Mobile 5.0

To turn off the WLAN radio tap the **Signal Strength** icon and select **Disable Radio**. A red X appears across the icon indicating that the radio is disabled (off).

To turn the radio back on, tap the **Signal Strength** icon and select **Enable Radio**. The red X disappears from the the icon indicating that the radio is enabled (on).

The *MC909X Integrator Guide, P/N: 72E-72216-xx* provides the wireless applications support information applicable to the MC9090-G RFID mobile computer.

Bluetooth and WAN Radios on Windows Mobile 5.0

NOTE The Flight Mode feature only turns off the WAN and Bluetooth radios. The WLAN radio must be turned off separately.

To turn off the Bluetooth and WAN radios:

Tap the **Connectivity** icon (on non-WAN devices) or the **Antenna/Signal** icon (on WAN devices) and select **Turn On Flight Mode**.

To turn off the Bluetooth and WAN radios, tap the **Connectivity** icon (on non-WAN devices) or the **Antenna/Signal** icon (on WAN devices) and select **Turn On Flight Mode**.

The *MC909X User Guide, P/N: 72E-72215-xx* provides the Bluetooth support information applicable to the MC9090-G RFID mobile computer.

Wireless Applications

Wireless Local Area Networks (WLANs) allow mobile computers to communicate wirelessly and send captured data to a host device in real time. Before using the mobile computer on a WLAN, the facility must be set up with the required hardware to run the wireless LAN and the mobile computer must be configured. Refer to the documentation provided with the access points (APs) for instructions on setting up the hardware.

To configure the mobile computer, a set of wireless applications provide the tools to configure and test the wireless radio in the mobile computer. The **Wireless Application** menu on the task tray provides the following wireless applications:

- Wireless Status
- Wireless Diagnostics
- Find WLANs
- Manage Profiles
- Options
- Enable/Disable Radio
- Log On/Off

Tap the **Signal Strength** icon to display the **Wireless Applications** menu.

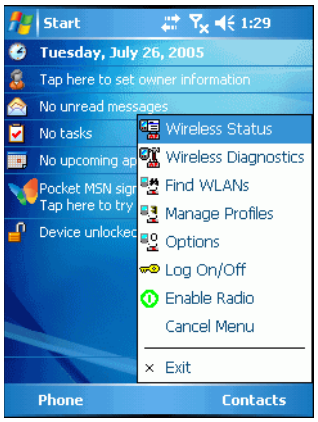


Figure 1-5 *Wireless Applications Menu*

The *MC909X Integrator Guide, P/N: 72E-72216-xx* provides the wireless applications support information applicable to the MC9090-G RFID mobile computer.

ActiveSync

To communicate with various host devices, install Microsoft ActiveSync (version 4.1 or higher) on the host computer. Use ActiveSync to synchronize information on the mobile computer with information on the host computer. Changes made on the mobile computer or host computer appear in both places after synchronization.

ActiveSync software:

- Allows working with mobile computer-compatible host applications on the host computer. ActiveSync replicates data from the mobile computer so the host application can view, enter, and modify data on the mobile computer.
- Synchronizes files between the mobile computer and host computer, converting the files to the correct format.
- Backs up the data stored on the mobile computer. Synchronization is a one-step procedure that ensures the data is always safe and up-to-date.
- Copies (rather than synchronizes) files between the mobile computer and host computer.
- Controls when synchronization occurs by selecting a synchronization mode, e.g., set to synchronize continually while the mobile computer is connected to the host computer, or set to only synchronize on command.
- Selects the types of information to synchronize and control how much data is synchronized.

The *MC909X Integrator Guide, P/N: 72E-72216-xx* provides the ActiveSync support information applicable to the MC9090-G RFID mobile computer.

Chapter 2

Accessories

Introduction

The series 9000 accessories provide a wide variety of product support capabilities. Accessories include cradles, keypads, Magnetic Stripe Reader (MSR) and Cable Adapter Module (CAM) snap-on, four slot spare battery charger, headphone, Multimedia Card (MMC), Secure Device (SD) card, Universal Battery Charger (UBC) adapter, wall mounting bracket and shelf slide.

Keypads

The mobile computer has interchangeable modular keypads. However, only the *53-Key RFID* keypad can be used with the MC9090-G RFID mobile computer. The modular keypad can be changed in the field as necessary. The *MC909X Integrator Guide, P/N: 72E-72216-xx* provides the keypad support information applicable to the MC9090-G RFID mobile computer:

- 53-key RFID keypad

Cradles

The *MC909X Integrator Guide, P/N: 72E-72216-xx* provides the cradle support information applicable to the MC9090-G RFID mobile computer:

- Single Slot Serial/USB cradle charges the mobile computer main battery and a spare battery. It also synchronizes the mobile computer with a host computer through either a serial or a USB connection.
- Four Slot Charge Only cradle charges the mobile computer main battery.
- Four Slot Ethernet cradle charges the mobile computer main battery and synchronizes the mobile computer with a host computer through an Ethernet connection.

Miscellaneous

The *MC909X Integrator Guide, P/N: 72E-72216-xx* provides the miscellaneous support information applicable to the MC9090-G RFID mobile computer:

- Four Slot Spare Battery Charger charges up to four mobile computer spare batteries.
- Headphone can be used in noisy environments.
- Modem Module enables data communication between the mobile computer and a host computer, remotely through the phone lines, and synchronizes information between the mobile computer and a host computer.
- Multimedia Card (MMC) provides secondary non-volatile storage. (An SD card may also be used.)
- UBC adapter adapts the UBC for use with the MC9000 batteries.
- Wall Mounting Bracket and Shelf Slide can be used for wall mounting applications.

Snap-on Modules

The *MC909X Integrator Guide, P/N: 72E-72216-xx* provides the snap-on module support information applicable to the MC9090-G RFID mobile computer:

- MSR connects on to the mobile computer and adds magstripe read capabilities.
- CAM connects on to the mobile computer and is used to connect cables to the mobile computer.

Both of the snap-on modules use the cables listed below:

- AC line cord (country-specific) and power supply, charges the mobile computer.
- Auto charge cable, charges the mobile computer using a vehicle cigarette lighter.
- DEX cable, connects the mobile computer to a vending machine.
- Serial cable, adds serial communication capabilities.
- USB cable, adds USB communication capabilities.
- Printer cable, adds printer communication capabilities.

Keypad

The mobile computer has a modular keypad. The modular keypad can be removed in the field as necessary. Keypad removal is required to replace the MMC card.

CAUTION Do not remove the keypad while the mobile computer is on and do not operate the mobile computer with the keypad detached. Follow proper Electro-Static Discharge (ESD) precautions to avoid damaging the MMC and SD card. Proper ESD precautions include, but are not limited to, working on an ESD mat and ensuring that the operator is properly grounded.

MC909X keypads are not interchangeable with MC9090-G RFID keypad.

Keypad Removal

1. Press the **Power** button to suspend the mobile computer.
2. Remove the two keypad screws. Slide the keypad down and lift up.

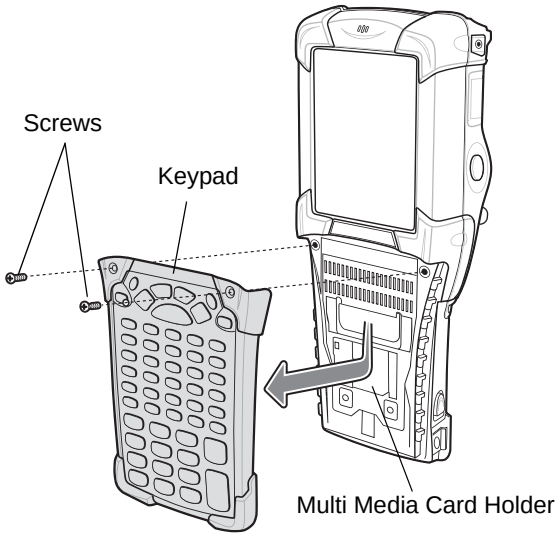


Figure 2-1 *Removing the Keypad*

CAUTION Do not apply more than 4 in-lbs of torque when tightening the keypad screws.

3. Replace the keypad and re-attach using the two screws.

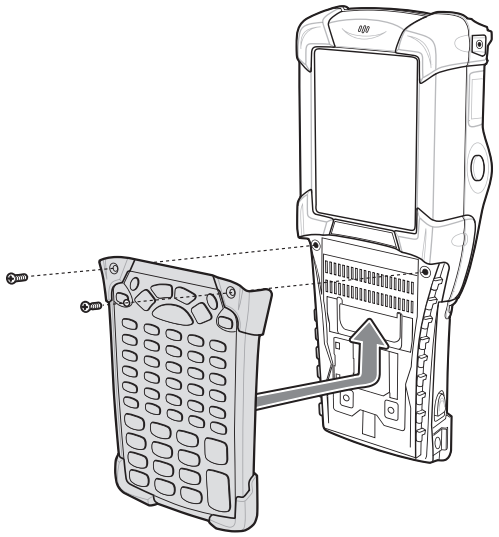


Figure 2-2 *Installing the Keypad*

4. Perform a cold boot.

Multi Media Card (MMC) / Secure Device (SD) Card

The MMC provides secondary non-volatile storage. The MMC is located under the keypad (see *Figure 2-1 on page 2-3*).

NOTE SD cards are inter-operable with MMC cards and can also be used in MC9090-G RFID mobile computers.

CAUTION Do not remove the keypad while the mobile computer is on and do not operate the mobile computer with the keypad detached. Follow proper ESD precautions to avoid damaging the MMC/SD. Proper ESD precautions include, but are not limited to, working on an ESD mat and ensuring that the operator is properly grounded.

To insert the MMC/SD card:

1. Press the **Power** button to suspend the mobile computer.
2. Remove the two keypad screws and slide the keypad down and lift off (see *Figure 2-1 on page 2-3*).
3. Lift the MMC/SD retaining door.
4. Position the MMC/SD card, with the contacts down, into the MMC/SD holder. The MMC/SD card corner notch fits into the holder only one way.
5. Snap the retaining door closed.

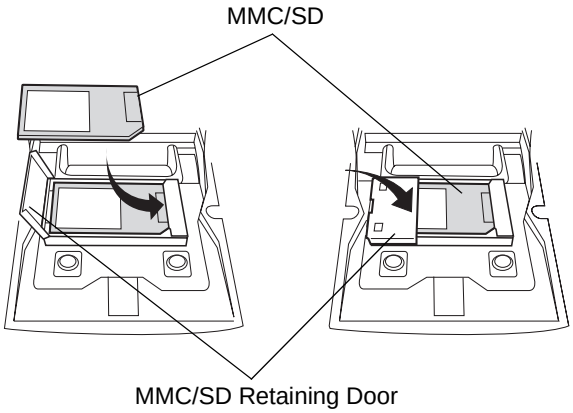


Figure 2-3 *Inserting the MMC/SD*

CAUTION Do not apply more than 4 in-lbs of torque when tightening the keypad screws.

6. Replace the keypad and re-attach using the two screws (see *Figure 2-2 on page 2-4*).

Chapter 3

Application Deployment for Mobile 5.0

Introduction

This chapter describes features available in Windows Mobile 5.0 including new security features, how to package applications, and procedures for deploying applications onto the mobile computer. The *MC909X Integrator Guide, P/N: 72E-72216-xx* provides the detailed information on these topics.

Security

The MC909X mobile computers implement a set of security policies that determine whether an application is allowed to run and, if allowed, with what level of trust. To develop an application, you must know the security configuration of the device, and how to sign an application with the appropriate certificate to allow the application to run (and to run with the needed level of trust). The *MC909X Integrator Guide, P/N: 72E-72216-xx* provides the security support information applicable to the MC9090-G RFID mobile computer. Information on the following topics is provided:

- Application Security
- Digital Signatures
- Device Management Security
- Remote API Security

Packaging

Packaging combines an application executable files into a single file, called a package. This makes it easier to deploy and install an application to the mobile computer. Package new applications and updates, such as new DLL files, as CAB files, then deploy them to Windows Mobile 5.0 devices. Refer to the *Microsoft Windows Mobile 5.0 Help* file for information on CAB files.

Deployment

To install applications onto the mobile computer, developers package the application and all required files into a CAB file, then load the file onto the mobile computer using one of the following options:

- Microsoft ActiveSync 4.1 or greater
- Storage Card
- AirBEAM
- Image Update (for updating the operating system).

Refer to the *Microsoft Windows Mobile 5.0 Help* file for information on CAB files.

The *MC909X Integrator Guide, P/N: 72E-72216-xx* provides the deployment support information applicable to the MC9090-G RFID mobile computer. Information on the following topics is provided:

- Installation Using ActiveSync
- Installation Using Storage Card
- Installation Using AirBEAM
- Image Update
- Creating a Splash Screen

XML Provisioning

To configure the settings on a mobile computer XML provisioning should be used. To install an XML provisioning file on the mobile computer, create a Cabinet Provisioning File (CPF) file. A CPF file is similar to a CAB file and contains just one file: _setup.xml. Like a CAB file, the CPF extension is associated with WCELoad.EXE. Opening a CPF extracts the XML code and uses it to provision and configure the mobile computer. The user receives an e-mail notification indicating success or failure.

XML Provisioning provides the ability to configure various features of the mobile computer (i.e., registry and file system). However, some settings require security privileges. To change registry settings via a CPF file, you need to have certain privileges (roles). Some registry keys require you to simply be an *Authenticated User*, while other registry keys require you to be a *Manager*. Refer to the Windows Mobile 5.0 Help file, *Metabase Settings for Registry Configuration Service Provider* section, for the default role settings in Windows Mobile 5.0.

For those registry settings that require the *Manager* role, the CPF file must be signed with a privileged certificate installed on the device. Refer to the *Microsoft Windows Mobile 5.0 Help* file and the *Windows Mobile 5.0 SDK* for instructions and sample test certificates.

The *MC909X Integrator Guide, P/N: 72E-72216-xx* provides the XML Provisioning support information applicable to the MC9090-G RFID mobile computer. Information on the following topics is provided:

- Creating an XML Provisioning File
- XML Provisioning vs. RegMerge and CopyFiles

Storage

The *MC909X Integrator Guide, P/N: 72E-72216-xx* provides the support information applicable to the MC9090-G RFID mobile computer for the three types of file Windows Mobile 5.0 file storage. Information on the following topics is provided:

- Random Access Memory (RAM)
- Persistent Storage
- Application folder.

System Configuration Manager

The System Configuration Manager (SCM) is a utility that runs on the development computer and is used to create configuration files. These files, when deployed to an mobile computer, set configuration parameters for that device. The configurable options for a mobile computer are defined in an XML file that is available on the Symbol DevZone for that mobile computer. SCM is also available on Symbol DevZone.

SCM eliminates the potential user errors that occur when manually editing registry settings. The *MC909X Integrator Guide, P/N: 72E-72216-xx* provides the SCM support information applicable to the MC9090-G RFID mobile computer. Information on the following topics is provided:

- File Types
- User Interface
- File Deployment

Rapid Deployment Client

The Rapid Deployment (RD) Client facilitates software downloads to a mobile computer from a Mobility Services Platform (MSP) Console FTP server. The MSP Console is a web-based interface to the wireless infrastructure monitoring and management tools provided by the MSP Lite or MSP Enterprise server.

When software packages are transferred to the FTP server, the mobile computer on the wireless network can download them. The location of software packages are encoded in RD bar codes. When the mobile computer scans a bar code(s), the software package(s) is downloaded from the FTP server to the mobile computer. Multiple mobile computers can scan a single RD bar code. The *MC909X Integrator Guide, P/N: 72E-72216-xx* provides the RD support information applicable to the MC9090-G RFID mobile computer. Information on the following topics is provided:

- Rapid Deployment Window
- Scanning RD Bar Codes

AirBEAM Smart

The AirBEAM Smart product allows specially designed software packages to be transferred between a host server and Symbol wireless handheld devices. Before transfer, AirBEAM Smart checks and compares package versions, so that only updated packages are loaded.

AirBEAM Smart resides on radio-equipped client devices and allows them to request, download, and install software, as well as to upload files and status data. A single communications session performs both file download and upload. The ability to transfer software over a radio network can greatly reduce the logistical efforts of client software management. The *MC909X Integrator Guide, P/N: 72E-72216-xx* provides the AirBEAM Smart support information applicable to the MC9090-G RFID mobile computer. Information on the following topics is provided:

- AirBEAM Package Builder
- AirBEAM Smart Client
- Synchronizing with the Server
- AirBEAM Staging

Symbol Mobility Developer Kits

The Symbol Mobility Developer Kit (SMDK) family of products allows you to write applications that take advantage of the capture, move and manage capabilities of Symbol mobile computers. Go to the Symbol DevZone to download the appropriate developer kit.

Chapter 4

RFID Demo

Introduction

The RFID sample application in MC9090-G RFID mobile computers with RFID technology provides the ability to perform a set of typical operations on Gen2, Class 0 and Class 1 RFID tags.

Class 0 tags are currently read only. Each tag contains three data areas: ID0, ID1 and ID2. The Electronic Product Code™ (EPC) data is stored in ID2. ID2 contains the EPC number (64 bits or 96 bits), Cyclic Redundancy Check (CRC), Kill Code and some flag bits.

Gen2 and Class 1 tags can be programmed, erased, locked and killed. Each tag contains the EPC number (64 or 96 bits), CRC and Kill Code. In addition, data can be collected by decoding in-range EPC RFID tags that beam back information.

While the trigger is pressed, the mobile computer interrogates all of the RFID tags within the radio frequency (RF) field of view. The mobile computer captures data from each new tag found and displays a tag icon in the main Tags window. When the trigger is released, the mobile computer stops interrogating tags.

The sample application supports the launching of an application that is capable of scanning bar codes or capturing images.

Launching RFID

To launch the RFID sample application, tap *Start - File Explorer - Application - Gemini_RFID* icon.

When the RFID sample application is launched, the main *Tags* window displays.

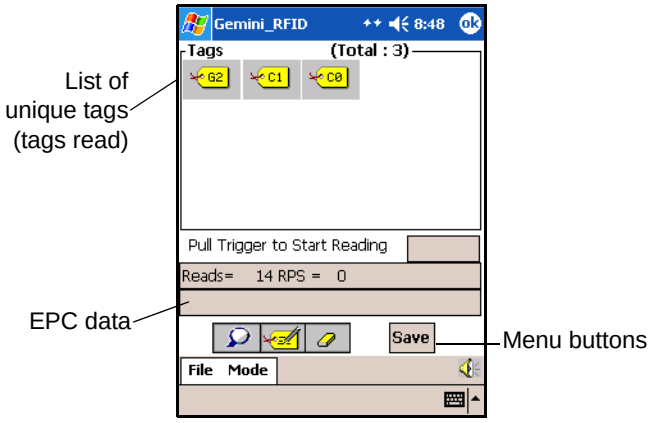


Figure 4-1 *RFID - Main Tags Window*

Table 4-1 *Main Tags Window and Settings Window, Icons*

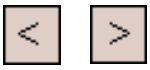
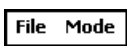
Icon	Description
	Launches the *Locate Tag* window (see *Locate Tag on page 4-9*).
	Launches the *Program Tag* window (see *Program Tag on page 4-10*).
	Clears the tag list (see *Clearing the Display on page 4-4*).
	Saves the complete list of tags (see *Saving Tag Data on page 4-5*).
	*Previous* and *Next* buttons appear on the menu when read tags exceed the amount of tags that can fit in the tag list display. Tap  to display the previous page. Tap  to display the next page.
	*File* and *Mode* menus (see *File Menu on page 4-5* and *Mode Menu on page 4-9*).

Table 4-1 *Main Tags Window and Settings Window, Icons (Continued)*

Icon	Description
	Tap to disable/enable the sound when a tag is read.
	The *RFID Module Power On* icon (displayed next to the *Speaker* icon) indicates that the RFID radio module is powered on and attempting to read tags.
	Use the Attenuation Slide Bar (see *Figure 4-5 on page 4-7*) to set the power range from 0 (full power) to 255 (low power). Drag the Attenuation Slide Bar to optimize tag reading and to minimize interference. For closer tag use a lower setting and for further away tag use a higher setting.

Reading Tags

When the mobile computer trigger is pressed, the mobile computer interrogates all of the tags within the radio frequency (RF) field of view. For each new tag found, the mobile computer beeps once and displays a tag icon in the main RFID *Tag* window. If the same tag is found again, the mobile computer does not beep.

When the trigger is released, the mobile computer stops interrogating tags. The total number of unique tags found displays in the *Tag* window.

To read tags:

1. Tap *Start* - *9000 Demo* - *RFID* icon.
2. Ensure that the mobile computer is within the RF field of view.
3. Set the RFID signal power. Use the *Attenuation* slide bar (see *Figure 4-5 on page 4-7*) to set a value in a range between 0 (full power) and 255 (low power).
4. Press and hold the mobile computer's trigger.
5. For each new tag found, a beep sounds one time, the Indicator LED flashes green, and a tag icon displays in the *Tag* window.

   Each tag is identified by class. For example, a Gen2 tag displays in the window labeled G2, a Class 0 tag displays in the window labeled C0, and a Class 1tag displays in the window labeled C1.
6. Release the trigger.

Selecting Tags

The *Tag* window can display up to 20 tags. If more than 20 tags are found, the application allows the user to page forward and backward through the list of icons representing the tags found.

To select a tag to view the tag data:

1. Tap *Start - File Explorer - Application - Gemini_RFID* icon.
2. Read a tag (see *Reading Tags on page 4-3*).
3. Select a tag icon in the *Tags* window.
4. The data contained in the tag, along with a count of how many times the selected tag was read, displays in the *Tags* window.

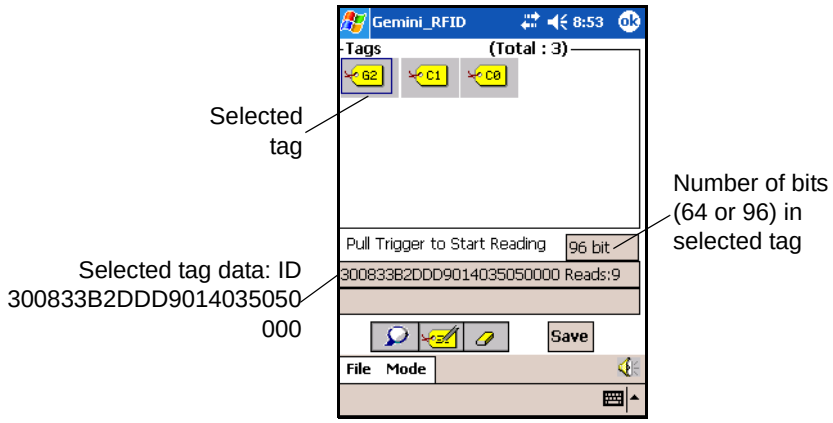


Figure 4-2 *RFID - Main Tags Window / Selected Tag*

Clearing the Display

To clear the tag list in the mobile computer's display, tap  .

Saving Tag Data

A list of read tags can be saved on the mobile computer. The application saves the tag list to the "*My Documents*" folder and names the file RFIDTaglist.csv.

The file is a .csv format (comma separated text file). This file format can be read by MS Excel, or other applications that support .csv. The sample file contains the following information.

Time Stamp, Tag ID, Tag Type, Read Count:

2005-04-17T15:34:53-05:00,H22EEDDAEBFCCEDEE,C1,10

2005-04-17T15:34:53-05:00,H8000800428254006,C1,10

2005-04-17T15:34:57-05:00,H8000800428254124,C1,15

The Time Stamp format is:

Year-month-dateTHour:Minute:seconds-TimezoneHourDifferential(GMT):TimezoneMinutesDifferntial

The Tag ID format is:

HTagData (H indicates the data is in hex)

The Tag Type format is:

CX, where X is the tag class. Currently the unit supports Gen2, Class 0 and Class 1 tags

The file can not be displayed on the mobile computer (with the factory supplied software). The file is intended to be downloaded to a host and displayed using an application that can read comma delimited fields, such as an Excel spreadsheet.

The file contains a one line header and one line for each unique tag found. The header line contains a comma separated list of field text descriptions. The tag lines contain the Tag ID starting with 'H' for hex, and a number indicating how many times the tag was read.

To save tag data:

1. Tap *Start* - *9000 Demo* - *RFID* icon.
2. Read a tag(s). See *Reading Tags on page 4-3*.
3. Tap 

.
4. Tap **OK** to save using the default name and directory, or enter a custom name /directory and then tap **OK**.

File Menu

Tap the *File* menu on the *Main Tags* window to view version information about RFID, log information, reboot, adjust settings, or exit the application.

About

Tap *File* - *About* to view the application version number, the RFID DLL version number, the RFID reader module firmware version number, date code, and serial and port information.

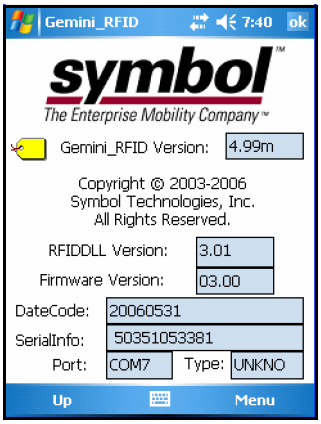


Figure 4-3 *RFID - About Window*

Log

Tap *File* - *Log* to display the *Log* menu.

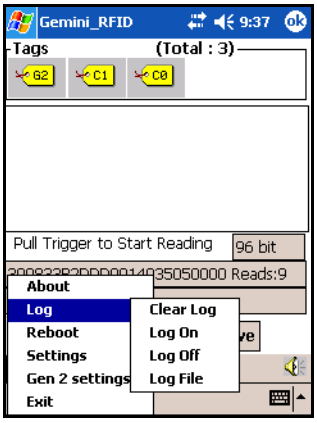


Figure 4-4 *RFID - Log Menu*

From the *Log* menu, tap:

- *Clear Log* to clear logged data.
- *Log On* turns on the log feature. With this feature is turned on, the display splits into two sections: upper and lower. The lower section displays all communication to the RFID radio module, including tag data.
- *Log Off* to turn off the log feature. *Log Off* is the default.
- *Log File* to create and save a log file. The log file is saved in the root directory on the mobile computer to a file named RXTXLog.txt. This file can be used to track errors reading RFID tags.

Reboot

Tap *File* - *Reboot* to issue a (warm) reboot command to the RFID radio module.

NOTE Reboot the RFID radio module only if tags are not being read.

Settings

The *Settings* window is used to set the number of iterations to read tags. To set the class type(s) to read (Gen2 is on by default and Class 0 and/or Class 1 are off by default). The settings window is also used to set and test read/write power. Tap *File* - *Settings* to display the Settings window.

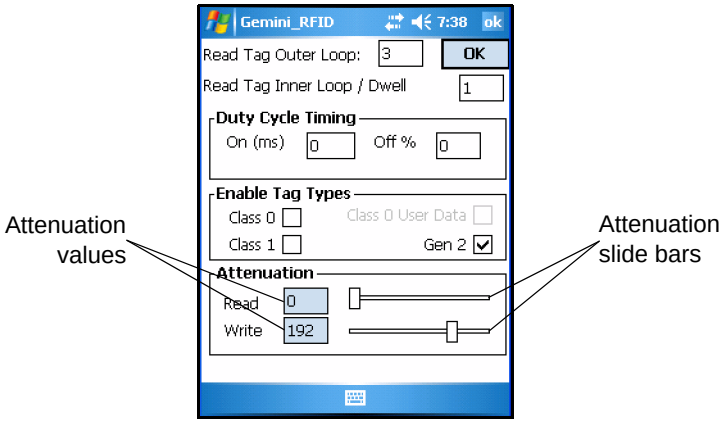


Figure 4-5 *RFID - Settings Window*

To establish settings:

- Enter a number in the *Read Tag Outer Loop:* text box to set the number of outer inventory loops (iterations to read tags). Up to 255 loops are allowed. The default *Read Tag Outer Loop* setting is 5.
- Enter a number in the *Read Tag Inner Loop / Dwell* text box to set the number of inner inventory loops (iterations to read tags). Up to 255 loops are allowed. The default *Read Tag Inner Loop* setting is 3.

> ***NOTE*** *Read Tag Outer Loop* and *Read Tag Inner Loop* settings attempt to read a tag for a period of time based on the parameters entered in these fields. For more information, refer to the SMDK Help file.

- Select the *Enable Gen2 Tag Reads* (default setting is to read Gen2 tags) check box to enable the mobile computer to read Gen2 tags.
- Select the *Enable Class 0 Tag Reads* (default setting is to not read Class 0 tags) check box to enable the mobile computer to read Class 0 tags.
- Select the *Enable Class 1 Tag Reads* (default setting is to not read Class 1 tags) check box to enable the mobile computer to read Class 1 tags.
- In the Attenuation area:
  - Set the read strength by moving the *Read* attenuation slide bar to a value in a range between 0 (full read power) and 255 (low read power/off).
  - Set the write strength by moving the *Write* attenuation slide bar to a value in a range between 0 (full write power) and 255 (low write power/off).
- Tap **OK** to exit *Settings*.
- Tap **Read Toggle** to test the attenuation settings. When tapped, **Read Toggle** acts like the mobile computer's trigger and can be used to test tag read and write strength.

Gen2 Operational Settings

The *Gen2 Operational Settings* window is used to configure the Gen2 tag operational parameters. Tap *File* - *Gen2 Settings* to display the Gen2 Operational Settings window.

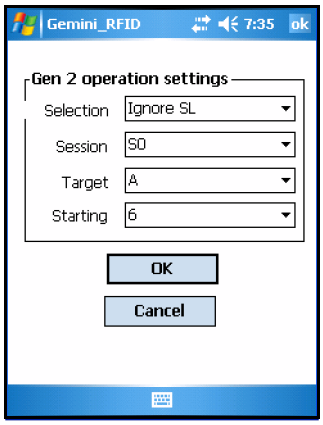


Figure 4-6 *Gen2 Operational Settings Window*

Table 4-2 *Gen2 Operational Settings*

Setting	Parameter	Description
Selection	Specifies the expected selected flag setting in the target tag population.	
	Ignore SL	Ignore the selected flag
	SL not set	Select tags without the selected flag set.
	SL set	Select tags with the selected flag set
Session	Specify the session used in the communication with the target tag population.	
	S0	Use session S0.
	S1	Use session S1.
	S2	Use session S2.
	S3	Use session S3.
Target	Specify the expected inventoried flag setting in the target tag population.	
	A	Select tags with the inventoried flag set to A.
	B	Select tags with the inventoried flag set to B.
Starting	Sets the number of slots in the first inventory round of the inventory algorithm.	
	0 - 15	Set the number of slots in the first inventory round of the inventory algorithm from 1 to 15.

Exit

Tap *File* - *Exit* to exit the RFID sample application.

Mode Menu

Tap the *Mode* menu to use the Inventory method to read tags, locate a tag, program a tag, scan a bar code, or write a tag. *Mode* menu options offer all of the operations available by tapping an icon on the main *Tags* window menu bar.

Inventory

Tap *Mode* - *Inventory* to start reading tags using the *Inventory* method. Using this method, the application performs as if the trigger is pulled. Tag read attempts continue until the *Inventory* menu option is tapped again.

Locate Tag

This option is used to find a specific tag.

1. Tap  in the main *Tags* window or tap *Mode* - *Locate Tag*.

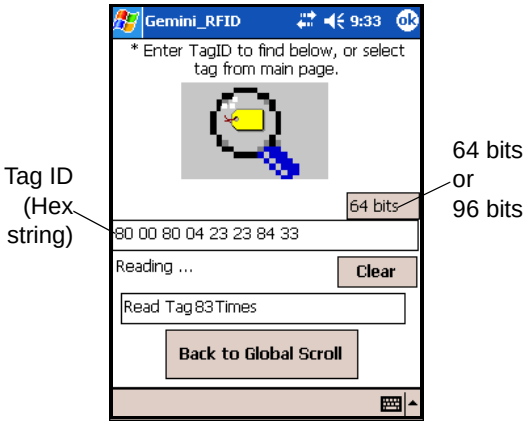


Figure 4-7 *RFID - Locate Tag Window*

2. Enter a valid *Tag ID* in the text box below the magnifying glass:
   - An 8-byte hex string for 64 bits
   - A 12-byte hex string for 96 bits.

> ***NOTE*** To pre-fill the text box with a valid Tag ID, select a tag in the main *Tags* window and tap  .

3. Pull the trigger to locate the tag. The mobile computer beeps when the tag is found. The faster the beep, the closer the mobile computer is to the located tag.

   Figure 4-7 shows tag ID 80 00 80 04 23 23 84 33 was read 83 times.

4. Tap **Back to Global Scroll** to return to the main *Tags* window.

Program Tag

This option can be used to program Gen2 and Class 1 RFID tags. (Class 0 tags are currently read only.)

Gen2 and Class 1 tags can be programmed, erased, locked and killed. Each tag contains 88 or 120 bits, which includes the EPC number (64 or 96 bits), CRC, and Kill Code. When programming Class 1 tags, only an array of bits, 64 or 96, need to be provided. Locking, and killing Class 1 tags requires a Kill Code which is 1 byte (8 bits) long. Since a Class 1 tag has a very small Kill Code and can be thwarted with many lock/kill attempts, it shuts down after a failed attempt for a extended amount of time (possibly up to 10 hours). In addition, data can be collected by decoding in-range EPC Class 1 RFID tags that beam back to the mobile computer the information they contain.

NOTE For detailed information about programming tags, refer to the SMDK Help file.

To program RFID tags:

1. Tap  in the main *Tags* window or tap *Mode - Program Tag*.

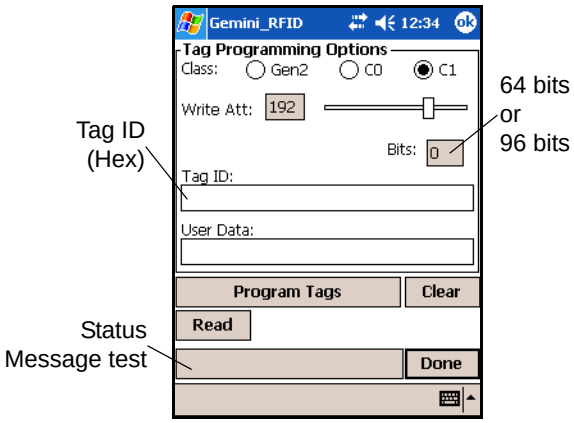


Figure 4-8 *RFID - Tag Programming Window*

2. Select the *Class:* 1 radio button to program Class 1 tags.
3. In the *Tag ID (Hex string)* text box below *Class:*, enter an 8-byte (64 bits) or 12-byte (96 bits) hex string to be programmed into the tag. This string can contain any number from 0-9, and a letter from A-F. Each byte must consist of 2 characters. Each byte should be separated by a space character.

   For example, if the tag should contain 80012390AAFD3617, type 80 01 23 90 AA FD 36 17 as shown in *Figure 4-8*.
4. Set the write strength by moving the *Write Att:* (attenuation) slide bar to a value in a range between 0 (full write power) and 255 (low write power/off).
5. A password is required to lock a tag and kill a tag. In the *0x: Lock/Kill Code* text box, enter a hex lock/kill password code. Class 1 requires a 1-byte code.

   NOTE Remember the lock/kill code. Once a tag is locked, it cannot be killed without the lock/kill code.
6. Tap **Program Tags**. It might take more than one attempt to program the tag.

7. When a tag is successfully programmed, a status message displays in the *Status Message* text box.
8. Tap **Read** to read a newly programmed tag.

> ***NOTE*** For a successful tag read, the allowable read distance from the front of the mobile computer scan exit window to the tag is 0.2 ft - 10 ft (0.061 m to 3.1 m).

9. Tap **Erase** to erase an unlocked tag.
10. Tap **Lock** to lock a tag so that it cannot be changed. A lock/kill code is required to lock a tag. See *Program Tag on page 4-10*.
11. Tap **Kill** to make a tag unreadable. A lock/kill code is required to kill a tag. (See *Program Tag on page 4-10*.)
12. Tap **Back to Global Scroll** to return to the main *Tags* window.

> ***NOTE*** To successfully write data to a tag, the tag must be no less than 1 ft (.31 m) from the antenna and no greater than 2 ft (.61 m) from the antenna.

Chapter 5

Maintenance & Troubleshooting

Introduction

This chapter includes instructions on cleaning and storing the mobile computer and provides troubleshooting solutions for potential problems during mobile computer operating.

Maintaining the Mobile Computer

For trouble-free service, observe the following tips when using the mobile computer:

- Take care not to scratch the screen of the mobile computer. When working with the mobile computer, use the supplied stylus or plastic-tipped pens intended for use with a touch-sensitive screen. Never use a pen or pencil or other sharp object on the surface of the mobile computer screen.
- Although the mobile computer is water and dust resistant, do not expose it to rain or moisture for an extended period of time. In general, treat the mobile computer as you would a pocket calculator or other small electronic instrument.
- The touch-sensitive screen of the mobile computer contains glass. Take care not to drop the mobile computer or subject it to strong impact.
- Protect the mobile computer from temperature extremes. Do not leave it on the dashboard of a car on a hot day, and keep it away from heat sources.
- Do not store or use the mobile computer in any location that is extremely dusty, damp or wet.
- Use a soft lens cloth to clean the mobile computer. If the surface of the mobile computer screen becomes soiled, clean it with a soft cloth moistened with a diluted window-cleaning solution.

✓ ***NOTE*** This MC9090-G RFID Integrator Guide Supplement is configured to provides only the unique set up and configuration procedures for the MC9090-G RFID mobile computers and accessories. The accessory troubleshooting is provided in the *MC909X Integrator Guide, P/N: 72E-72216-xx*.

Accessories

The *MC909X Integrator Guide, P/N: 72E-72216-xx* provides the troubleshooting information applicable to the following MC9090-G RFID mobile computer accessories:

- Bluetooth Connection
- Four Slot Charge Only Cradle
- Four Slot Ethernet Cradle
- Four Slot Spare Battery Charger
- Single Slot Serial/USB Cradle
- Cable Adapter Module
- Magnetic Stripe Reader
- Modem Module

Troubleshooting

Mobile Computer

Table 5-1 *Troubleshooting the Mobile Computer*

Problem	Cause	Solution
Mobile computer does not turn on.	Lithium-ion battery not charged.	Charge or replace the lithium-ion battery in the mobile computer.
	Lithium-ion battery not installed properly.	Ensure battery is installed properly. See *Installing and Removing the Main Battery on page 1-4*.
	System crash.	Perform a warm boot. If the mobile computer still does not turn on, perform a cold boot. See *Resetting the Mobile Computer on page 1-9*.
Rechargeable lithium-ion battery did not charge.	Battery failed.	Replace battery. If the mobile computer still does not operate, try a warm boot, then a cold boot. See *Resetting the Mobile Computer on page 1-9*.
	Mobile computer removed from cradle while battery was charging.	Insert mobile computer in cradle and begin charging. The lithium-ion battery requires less than four hours to recharge fully.
Cannot see characters on display.	Mobile computer not powered on.	Press the **Power** button.
During data communication, no data was transmitted, or transmitted data was incomplete.	Mobile computer removed from cradle or unplugged from host computer during communication.	Replace the mobile computer in the cradle, or reattach the Synchronization cable and re-transmit.
	Incorrect cable configuration.	See the System Administrator.
	Communication software was incorrectly installed or configured.	Perform setup. See Chapter 2, Accessories for details.
		Ensure that Microsoft ActiveSync 4.1 or greater is installed on the host computer.
No sound is audible.	Volume setting is low or turned off.	Unit may be a beeper only unit or incorrect Config Block is programmed into device.

Table 5-1 *Troubleshooting the Mobile Computer (Continued)*

Problem	Cause	Solution
Mobile computer turns itself off.	Mobile computer is inactive.	The mobile computer turns off after a period of inactivity. If the mobile computer is running on battery power, this period can be set to 30 sec., 1, 2, 3, 4, 5 or 6 minutes. If the mobile computer is running on external power, this period can be set to 1, 2, 3, 5, 10, 15 and 30 minutes. For Mobile 5.0 devices, Check the power settings by tapping **Start** > **Settings** > **System** tab > **Power** icon > **Advanced** tab. Change the setting if you need a longer delay before the automatic shutoff feature activates.
	Battery is depleted.	Replace the battery.
	Battery is not inserted properly.	Insert the battery properly (see *Installing and Removing the Main Battery on page 1-4*).
Tapping the window buttons or icons does not activate the corresponding feature.	LCD screen not aligned correctly.	Re-calibrate the screen.
	The system is hung.	Warm boot the system. To perform a warm boot (see *Resetting the Mobile Computer on page 1-9*).
A message appears stating that the mobile computer memory is full.	Too many files stored on the mobile computer.	Delete unused memos and records. You can save these records on the host computer.
	Too many applications installed on the mobile computer.	If you have installed additional applications on the mobile computer, remove them to recover memory. For Mobile 5.0 devices, tap **Start** > **Settings** > **System** tab > **Remove Programs** icon. Select the unused program and tap **Remove.**

Table 5-1 *Troubleshooting the Mobile Computer (Continued)*

Problem	Cause	Solution
The mobile computer does not accept scan input.	Scanning application is not loaded.	Verify that the unit is loaded with a scanning application. See the System Administrator.
	Unreadable bar code.	Ensure the symbol is not defaced.
	Distance between exit window and bar code is incorrect.	Ensure mobile computer is within proper scanning range.
	Mobile computer is not programmed for the bar code.	Ensure the mobile computer is programmed to accept the type of bar code being scanned.
	Mobile computer is not programmed to generate a beep.	If a beep on a good decode is expected and a beep is not heard, check that the application is set to generate a beep on good decode.
	Battery is low.	If the scanner stops emitting a laser beam when the trigger is pressed, check the battery level. When the battery is low, the scanner shuts off before the mobile computer low battery condition notification. Note: If the scanner is still not reading symbols, contact the distributor or Symbol Technologies.

Technical Specifications

The following tables summarize the mobile computer's intended operating environment and general technical hardware specifications.

Mobile Computer

This table summarizes the technical specifications.

Table A-1 *Technical Specifications*

Item	MC9090-G RFID
Physical and Environmental Characteristics	
Dimensions	9.1 in. L x 3.6 in. W x 7.6 in. H 23.1 cm L x 9.1 cm H x 19.3 cm H
Weight	25 oz.(includes battery, scanner and radio)
Keyboard	28-key; 43-key; 53-key Terminal Emulation (5250, 3270, VT)
Display	3.8 in. 1/4 VGA Color
Power	Removable, rechargeable 7.2 V Lithium Ion 2200 mAh battery pack, 15.8 watt hours
Performance Characteristics	
CPU	XScale Bulverde PXA270 processor at 624MHz
Operating System	Microsoft Windows Mobile 5.0 Premium Edition
Memory (RAM/ROM)	Windows Mobile: 64MB/128MB
Expansion	SD/MMC Card
Application Development	PSDK, DCP and SMDK available through Symbol Developer Zone Web Site
Data Capture Options	Omni-directional 1D and 2D imaging engine reads symbologies and captures grayscale images and signatures with intuitive laser aiming.
User Environment	

Table A-1 *Technical Specifications (Continued)*

Item	MC9090-G RFID
Operating Temperature	-4°F to 122°F (-20°C to 50°C)
Storage Temperature	-25°F to 160°F (-40°C to 70°C)
Battery Charging Temperature	32 °F to 104 °F (0 °C to +40 °C) ambient temperature range.
Humidity	5% to 95% non condensing
Drop Specification	Multiple 6 ft.(1.8m) drops to concrete across operating temperature range
Tumble	2,000 one-meter tumbles at room temperature (4,000 hits)
Environmental Sealing	IP64 (electronic enclosure)
ESD	+/-15kVdc air discharge +/-8kVdc direct discharge +/-8kVdc indirect discharge
Wireless Data Communications	
WLAN	Symbol 802.11b/g
Output Power	100mW U.S. and International
Data Rate	802.11b: 11Mb per second 802.11g: 54Mb per second
Antenna	Internal
Frequency Range:	802.11b: 2.4 GHz; country-dependent 802.11g: 2.4 GHz; country-dependent
Bluetooth	Bluetooth Version 1.2 with BTExplorer (manager) included
Peripherals and Accessories	
Cradles	Single-slot and 4-slot cradles available
Printers	Supports extensive line of Symbol approved printers, cables and accessories
Charger	4-Slot universal battery charger
Other Accessories	Cable Adapter Module; Magnetic Stripe Reader; Modem; Full set of holsters In accordance with the SymbolPlus partner program
Regulatory	
Electrical Safety	Certified to UL60950-1, CSA C22.2 No. 60950-1, EN60950-1, IEC 60950-1
RF & EMC	FCC PArt 2 (SAR), FCC Part 15, RSS210; EN 300 328 & EN 301 487, EN55022, EN55024

Table A-2 *Data Capture Options*

Item	Description		
Imaging Decode Capability	Code 39	Code 128	Code 93
	Codabar	Code 11	Interleaved 2 of 5
	Discrete 2 of 5	MSI	EAN-8
	EAN-13	UPCA	UPCE
	UPC/EAN supplementals	Coupon Code	Trioptic 39
	Webcode	TLC39	Composite AB
	Composite C	Micro PDF-417	PDF-417
	Macro PDF-417	(Macro) Micro PDF-417	QR Code
	RSS Expanded	RSS Limited	RSS-14
	Data Matrix	Maxi Code	US Postnet*
	US Planet	UK 4-state	Australian 4-state
	Canadian 4-state	Japanese 4-state	Dutch Kix
	*To be supported at a later date. Go to http://software.symbol.com/ for a list of the latest supported symbologies.		

Modem Module

Table A-3 *Environmental Parameters and Technical Hardware Specifications*

Item	Description
Asynchronous character format	Up to 10 bits, including data, start, stop, and parity bits
Asynchronous data rates	Transmission rate fallback through 300 bps
Chipset	Conexant SCM
Compatible public switched network jacks	RJ11
Dialing capability	Tone and rotary pulse
Line requirements	Public switched telephone network (PSTN) including international connections
Operating environment	Altitude: up to 20,000 ft. Humidity: 10% to 90% non-condensing
Operating temperature	Operating: 32^{o} to 122^{o}F / 0^{o} to 50^{o}C Storage: -4^{o} to 149^{o}F / -20^{o} to 65^{o}C
Operating modes	Asynchronous, full duplex, automatic and manual call originate
Performance	Line speed up to 33,600 bps HHC to modem speed (DTE speed) up to 57,600 bps V.42bis data compression V.42 LAPM error correction
Current consumption	100 mA active <10 mA sleep
Pulse dialing rate (except where prohibited under TBR-21 rules)	10 pulses per second Pulse dialing duty cycle: 39/61% (US) make-to-break ratio
Ringer equivalence	0.1 dBm
Standards & protocols	Bell 103, Bell 212A, Hayes AT command set, and ITU Vs. 17, 21, 22 A & B, 22bis, 23, 25bis, 27 ter, 29, 32, 32bis, 42bis
Tone detected	Dial, busy, ring back, modem answer tones. Blind dialing based on time-out periods available for incompatible tones.
AC Adapter	9V, 2 amp regulated AC/DC adapter allows unlimited modem use. Do NOT substitute an AC adapter; using an incorrect AC power supply causes electrical damage to the mobile computer and voids warranty.

Mobile Computer Pin-Outs

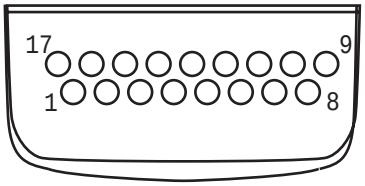


Figure A-1 *Pin Locations*

Table A-4 *Pin-Outs*

PIN Number	Signal Name	Function
1	USB_GND	USB
2	USB_D_PLUS	USB
3	TXD	RS232C
4	RXD	RS232C
5	DCD	RS232C
6	RTS	RS232C
7	DSR	RS232C
8	GND	Ground, 2.5A max.
9	RI	RS232C
10	CRADLE_DET	Grounded by cradle when in cradle
11	DTR	RS232C
12	Not connected	Not connected
13	POWER_IN	12V, 2.5A max
14	CTS	RS232C
15	USB_5V_DET	USB
16	USB_D_MINUS	USB
17	EXT_PWR_OUT	3.3V @500mA

Accessory CAM and MSR Pin-Outs

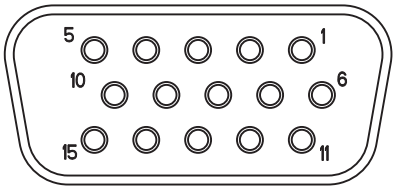


Figure A-2 *CAM and MSR Serial Connector*

Table A-5 *CAM and MSR Serial Connector Pin-outs*

Pin	Signal
1	USB_5V_DET
2	USB_D_MINUS
3	USB_D_PLUS
4	GND
5	GND
6	PWR_EXT_OUT
7	CRADLE_DET*
8	DSR
9	DCD
10	TXD
11	CTS
12	DTR
13	RI
14	RTS
15	RXD

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Symbol Technologies, Inc.
One Symbol Plaza
Holtsville, New York 11742-1300
http://www.symbol.com

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